REMARKS

I. Status Summary

Claims 1-15 are pending in the present application. Claim 1 has been amended. Claim 12 has been canceled. Therefore, upon entry of this Amendment, Claims 1-11, and 13-15 will be pending. Support for these amendments can be found throughout the present patent application, notably in Figures 2 and 3 of the drawings. No new matter has been introduced by the present amendment. Reconsideration of the application as amended and based on the arguments set forth hereinbelow is respectfully requested.

II. Foreign Priority

The Examiner stated that he was unable to locate a certified copy of the German foreign application. (Official Action, page 2.) Applicants respectfully submit that a certified copy of German Application No. 100 49 331.9 was submitted with our Response to the Notice to File Missing Parts filed December 14, 2001. For the Examiner's records, applicants submit herewith a copy of the certified copy of German Application No. 100 49 331.9 that was sent with the Response to the Notice to File Missing Parts on December 14, 2001.

III. Claim Rejections Under 35 U.S.C. §102

The Examiner has rejected Claims 1-8, 10, 11, 15, and 16 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,751,315 to Liu et al. (hereinafter, "Liu"). This rejection is respectfully traversed.

Upon careful consideration and review of Liu, applicants respectfully submit that Liu does not disclose each and every element recited in Claim 1 and therefore does not anticipate the claim. To more particularly define and claim the subject matter disclosed in the present patent application, Claim 1 is amended as indicated above to recite a broadband driver for signals that are transmitted in different ranges via a transmission channel. Claim 1 is also amended to recite the following: (1) a first broadband driver circuit for driving first transmission signals having signal frequencies that lie in a first frequency range; (2) a second broadband driver circuit for driving second transmission signals having signal frequencies that lie in a second frequency range; (3) wherein the first broadband driver circuit and the second broadband driver circuit have a signal output, and wherein the signal outputs of both broadband drivers are connected in parallel to said transmission channel; and (4) wherein at least one of the two broadband driver circuits has a frequency-dependent positive-feedback circuit for impedance synthesis of a frequency-dependent output impedance of the broadband driver circuit, and wherein the output impedance has a first resistance value in the first frequency range and a second resistance value in the second frequency range. Summarily, Liu does not disclose the elements recited in amended Claim 1.

The Examiner contends that Liu teaches a broadband driver as recited in Claim 1 at Figure 2 and the corresponding portion of the specification. Referring to Figure 2, Liu discloses a high band width phone line transceiver **24** including a transmit signal path and a receiving signal path. The transmit signal path of transceiver **24** includes a

digital/analog converter **51**, a low pass filter **52**, and a compensation network **53** connected in series. The receiving signal path includes an operational amplifier **38**, a high pass filter **41**, and an analog/digital converter **42** connected in series. The output of the transmit signal path is connected via a line impedance matching section **27** and isolation capacitors **25** to a transmission channel **22** comprising a twisted copper wire pair. The output of the transmission signal path is also connected via a hybrid converter section **31** to the input of the receiving signal path of transceiver **24**. Operational amplifier **54** in the transmission signal path is the only circuit for driving a transmission signal in transceiver **24**. Thus, Liu discloses only one driver circuit for driving a transmission signal. In marked contrast, Claim 1 recites a first and second broadband driver circuits for driving first and second transmission signals. Liu discloses another driving circuit, i.e., operational amplifier **38**, for forming part of the receiving signal path. However, operational amplifier **38** is not utilized as a driving circuit a transmission signal path. Thus, Liu does not teach each and every feature recited in Claim 1 and cannot anticipate the subject matter recited in Claim 1.

In addition, as stated above, Claim 1 recites that the signal output of both broadband drivers are connected in parallel to the transmission channel. Referring to Figure 2 of Liu, the output of operational amplifier **38** is not connected in parallel to the output of operational amplifier **54**. Rather, the output of operational amplifier **38** is connected via high pass filter **41** and analog/digital converter **42** to digital signal processor **43**. For this additional reason, Liu does not teach each and every feature recited in Claim 1 and cannot anticipate the subject matter recited in Claim 1.

Element (d) of Claim 1 recites that the two broadband driver circuits has a frequency-dependent positive-feedback circuit for impedance synthesis of a frequency-dependent output impedance of the broadband driver circuit. In addition, element (d) of Claim 1 recites that the output impedance has a first resistance value in the first frequency range and a second resistance value in the second frequency range. Referring to column 5, lines 37-40, Liu teaches that the transmit signal is conducted to a compensation network **53** which maintains a flat impedance characteristic over the upload bandwidth. Therefore, the impedance characteristic over the upload bandwidth is flat or constant. In contrast, Claim 1 recites that the output impedance has a first resistance value in the first frequency range and a second resistance value in the second frequency range.

Exemplary support for element (d) of Claim 1 is provided with respect to Figure 4 and corresponding description of the present application. Figure 4 is a graph of an output impedance curve for a first broadband driver circuit for driving audio frequency signals in the embodiment of the broadband driver shown in Figure 3 of the present application. Referring to Figure 4, an output impedance $\mathbf{z_{aus\ (out)}}$ of first broadband circuit driver **19** (shown in Figure 3) includes up to a lower cutoff frequency $\mathbf{f_c}$, a low resistance. Output impedance impedance $\mathbf{z_{aus\ (out)}}$ increases sharply between lower cutoff frequency $\mathbf{f_c}$ and upper cutoff frequency $\mathbf{f_o}$. The resistance value is high above upper cutoff frequency $\mathbf{f_o}$. Element (d) of Claim 1 recites the feature of the output impedance of the broadband driver circuit having a first resistance in the first frequency range and a second resistance value in the second frequency range. In

contrast, as stated above, Liu specifically teaches that the impedance characteristic of compensation network **53** is flat or constant over the upload bandwidth. Therefore, for this additional reason, it is respectfully submitted that Liu does not teach each and every feature recited in Claim 1 and cannot anticipate the subject matter recited in Claim 1.

Based on the above comments, applicants respectfully request that the rejection of Claim 1 under 35 U.S.C. § 102(e) be withdrawn and the claim allowed at this time. Claims 2-8, 10, 11, 15, and 16 depend from Claim 1. Therefore, applicants respectfully request that the rejection of Claims 2-8, 10, 11, 15, and 16 under 35 U.S.C. § 102(e) also be withdrawn and the claims allowed at this time because they are believed to be patentably distinguished based on their dependency on Claim 1.

IV. Claim Rejections Under 35 U.S.C. §103

Claims 12-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of U.S. Patent No. 6,281,747 to Ahuja et al. (hereinafter, "Ahuja"). Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of U.S. Patent No. 6,314,180 to Bingel (hereinafter, "Bingel"). These rejections are respectfully traversed.

IV.A. The Rejection Under 35 U.S.C. §103(a) Over Liu In View of Ahuja

Claim 12 has been canceled. Claims 13 and 14 depend from Claim 1. As stated above, Claim 1 has been amended to recite the following: (1) a first broadband driver circuit for driving first transmission signals having signal frequencies that lie in a

first frequency range; (2) a second broadband driver circuit for driving second transmission signals having signal frequencies that lie in a second frequency range; (3) wherein the first broadband driver circuit and the second broadband driver circuit have a signal output, and wherein the signal outputs of both broadband drivers are connected in parallel to said transmission channel; and (4) wherein at least one of the two broadband driver circuits has a frequency-dependent positive-feedback circuit for impedance synthesis of a frequency-dependent output impedance of the broadband driver circuit, and wherein the output impedance has a first resistance value in the first frequency range and a second resistance value in the second frequency range. Summarily, neither Liu nor Ahuja, alone or in combination, discloses the features recited in amended Claim 1. Additionally, neither Liu nor Ahuja offers any suggestion to modify the system disclosed therein to arrive at the subject matter recited in Claim 1.

The Examiner contends that Liu teaches all of the subject matter of Claims 12-14 except that the signal outputs of operational amplifiers **38** and **54** are connected in parallel to each other and a transformer. (Official Action, page 4.) The Examiner further contends that column 4, lines 41-47, and Figures 2b and 6 Ahuja teach a power efficient line driver comprising output signals of operational amplifiers **212** and **214** connected in parallel, to a transformer, and to a two-wire telephone line for delivering power to a low impedance load. (Official Action, page 4.) The Examiner also contends that it would have been obvious to combine the references to achieve the claimed subject matter. (Official Action, page 4.)

As stated above, Liu does not disclose the above features of Claim 1. Ahuja fails to overcome the significant shortcomings of Liu. Referring to Figure 2, Ahuja is directed to an ADSL line driver having two drivers **212** and **214**. The outputs of drivers **212** and **214** are connected to a transformer. Liu discloses a differential ADSL line driver comprising operational amplifiers **212** and **214** that receive the same input signal. In contrast, Claim 1 recites a broadband driver circuit that drives a first transmission signal having signal frequencies that lie in a first frequency range and a second broadband driver circuit that drives a second transmission signal having signal frequencies that lie in a second frequency range. Accordingly, because of the cancellation of Claim 12 and the dependency of Claims 13 and 14 on Claim 1 and the cancellation of Claim 12, it is respectfully submitted that the rejection of Claims 12-14 should now be withdrawn.

IV.B. The Rejection Under 35 U.S.C. §103(a) Over Liu In View of Bingel

Claim 9 depends from Claim 1. As stated above, Claim 1 has been amended to recite the following: (1) a first broadband driver circuit for driving first transmission signals having signal frequencies that lie in a first frequency range; (2) a second broadband driver circuit for driving second transmission signals having signal frequencies that lie in a second frequency range; (3) wherein the first broadband driver circuit and the second broadband driver circuit have a signal output, and wherein the signal outputs of both broadband drivers are connected in parallel to said transmission channel; and (4) wherein at least one of the two broadband driver circuits has a frequency-dependent positive-feedback circuit for impedance synthesis of a

frequency-dependent output impedance of the broadband driver circuit, and wherein the output impedance has a first resistance value in the first frequency range and a second resistance value in the second frequency range. Summarily, neither Liu nor Bingel, alone or in combination, discloses the features recited in amended Claim 1. Additionally, neither Liu nor Bingel offers any suggestion to modify the system disclosed therein to arrive at the subject matter recited in Claim 1.

The Examiner contends that Liu teaches all subject matter claimed in Claims 1 and 9 except for that the complex impedance of the positive-feedback circuit decreases as the signal frequency increases. (Official Action, page 4.) The Examiner further contends that Bingel teaches such a feature at column 6, lines 13-37, for a purpose of controlling forward path gain. (Official Action, page 4.) The Examiner also contends that it would have been obvious to combine the references to achieve the claimed subject matter. (Official Action, pages 4 and 5.)

As stated above, Liu does not disclose the above features of Claim 1. Bingel fails to overcome the significant shortcomings of Liu. Referring to Figure 4, a current source **52** includes an operational amplifier **U18** having a signal output **48** which is fed back via a feedback circuit **54**. Feedback circuit **54** includes a high-pass filter to the input of operational amplifier **U18**. As the frequency of the output signal on line **48** increases, the simulated impedance of the frequency-dependent synthetic termination system increases at a rate of 12 dB/octave until an impedance of about 50 ohm is reached. (Bingel, column 6, lines 17-21.) Now, referring to Figure 3, Bingel also teaches an analog front-end **11** having a frequency dependent synthetic termination

system **10** and a differential amplifier **56** that sends a differential signal on lines **48** and **50**. Thus, analog front-end **11** of Bingel discloses only one driving circuit for driving a transmission signal. There is no disclosure in Bingel of a second transmission signal having a signal frequency in another frequency range. In contrast, Claim 1 recites first and second broadband driver circuits for driving first and second transmission signals, respectively, having signal frequencies that lie in first and second frequency ranges, respectively. Accordingly, it is therefore respectfully submitted that the combination of the cited references do not teach or suggest the features recited in Claim 1.

Bingel also discloses that an impedance of approximately 50 ohm is provided when the frequency in line **48** is greater than 16 kHz. Thus, Bingel teaches that the impedance of the driver circuit is frequency dependent and has an impedance of 50 ohm in a frequency range greater than 16 kHz. Thus, Bingel fails to teach that the output impedance has a first resistance value in a first frequency range and a second resistance value in a second frequency range, as recited by element (d) of Claim 1. Therefore, Bingel fails to teach the features recited by Claim 1. In addition, applicants respectfully submit that Bingel fails to suggest the features recited by element (d) of Claim 1.

Accordingly, because of the dependency of Claim 9 on Claim 1, it is respectfully submitted that the rejection of Claim 9 should now be withdrawn.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

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